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Press Release

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2020 in review: looking back on a momentous year

LIH releases its 2020 Annual Report

“The year 2020 can undoubtedly be defined as the most momentous period in the history of science and mankind and, consequently, for LIH and for the national biomedical research ecosystem in which it operates. The present annual report provides an unparalleled opportunity to reflect on the scientific excellence of our institute and celebrate the many collective achievements of its dedicated staff” – Prof Ulf Nehrbass, LIH CEO.

COVID-19: A collaborative priority area for Luxembourg and LIH

From the very beginning of the pandemic, LIH has taken on a leading role in the national fight against COVID-19, coordinating the joint efforts of the Research Luxembourg COVID-19 Taskforce partners. The rapid mobilisation of the government and of the public research sector allowed the prompt setup of several national projects and initiatives, which gained international visibility for their seamless and rigorous organisation and for the high quality of the research carried out.

The first study to be launched in March 2020 was “CON-VINCE”, led by LIH Transversal Translational Medicine (TTM) Director Prof Rejko Krüger, which aims to evaluate the dynamics of the spread of COVID-19, with a specific interest in the asymptomatic and oligosymptomatic individuals, within the Luxembourgish population by testing a representative panel of over 1,800 people for the presence of the SARS-CoV-2 virus. This joint effort is financially supported by the Luxembourg National Research Fund (FNR) and by the André Losch Foundation. This was followed by “Predi-COVID”, a cohort study supported by the Health Inspection Department of the Ministry of Health, co-financed by the FNR and the André Losch Foundation and coordinated by the LIH Department of Population Health (DoPH), which seeks to identify important risk factors and biomarkers associated with COVID-19 severity and long-term health consequences of the disease. The data and samples generated under the study also gave rise to three additional COVID-19 projects involving LIH, which were funded by the Horizon 2020 ERAvsCORONA Action Plan and which kicked off in late 2020. In addition, in March 2020, the Clinical and Epidemiological Investigation Centre (CIEC) of DoPH, the Centre Hospitalier de Luxembourg (CHL) and the Hôpitaux Robert Schuman (HRS) joined the consortium of the European clinical trial “DisCoVeRy”. The preliminary results, published in December 2020 in the New England Journal of Medicine, showed that the four investigated antiviral therapies — remdesivir, lopinavir/ritonavir, interferon beta and hydroxychloroquine — did not improve the clinical course of COVID-19 in hospitalised patients, representing however a step forward in the understanding of the disease and in ensuring patient

safety.

As part of the national exit strategy, LIH coordinated the first phase of the unique nationwide “Large Scale Testing” (LST) campaign, with the goal of identifying positive cases and breaking infection chains early on. During Phase I, which ran from May 27th until July 27th 2020, over 1.4 million invitations were sent and over 566,000 tests were conducted, covering 49% of Luxembourg residents and 22% of cross-border workers. The LST detected 26% of all positive cases related to the epidemic, 33% of which were asymptomatic, demonstrating the significant role of this initiative in containing the pandemic. Indeed, the total number of cases would have been 43% higher without the LST. The success of the LST was also enabled by the comprehensive communication campaign implemented by LIH and the COVID-19 Taskforce, targeting all key national and international media. The full results of the LST were published in the prestigious international journal *The Lancet Regional Health – Europe* in March 2021.

“This unparalleled initiative has been widely recognised at the international level, strengthening the institute’s and the country’s reputation as a leader in public health and biomedical research. The LST also confirmed Luxembourg’s high level of resilience, adaptability and reactivity to an unprecedented crisis of global dimensions, contributing to reinforcing national preparedness to future epidemics”, states Prof Nehrbass.

Translational research excellence in Luxembourg and beyond

In parallel to its commitment to COVID-19 activities, LIH also pursued its efforts to advance translational medicine across all key priority research areas. In the field of immunology, the work of LIH researchers highlighting the link between the immune system, metabolism, nutrition and the health-disease balance received widespread international acclaim, resulting in the publication of their findings in top journals such as *Cell Metabolism* and *Nature Communications*. Similarly, major publications were released in the areas of digital health and artificial intelligence, including a paper on machine-learning approaches to advance the diagnosis of neurodegenerative diseases. In oncology, breakthrough research opening up new therapeutic avenues for personalised treatment, with the immune system acting as a common thread and new patient-based models as enablers, led to publications in *Science Advances* and *Nature Communications*. This excellence was also publicly acknowledged through the award of numerous national and international prizes and accolades to LIH scientists, including the renowned 2019 Galien Prize in Pharmacology and the “Prix du Fonds Léon et Henri Fredericq”, alongside many other donations from private and institutional donors.

“I wish to thank the Ministry of Higher Education and Research, the Ministry of Health and the National Research Fund for their unwavering support throughout this difficult year. My acknowledgements also go to our national and international partners, clinicians and researchers for the enriching cooperation, and of course to our patients for their trust and participation in our clinical studies”, says Prof Nehrbass.

“Despite the socio-economic and health tumult caused by the pandemic, 2020 was the year LIH could prove its reputation as a truly translational institute and as a leader in clinical research, not just nationally but internationally, thereby contributing to upholding Luxembourg’s standing as the hotbed for disease management. None of said achievements could have been possible without the passion and dedication of the entire LIH staff and the enlightened leadership and mentoring of the management. I therefore extend my

warmest gratitude to the people behind the excellence of LIH", concludes Dr Gregor Baertz, President of the LIH Board of Directors.

The year 2020 in figures

314 scientific publications
3 patent applications
18 new partnerships with a private partner
232 new signed agreements
321 ongoing projects
9 clinical trials with LIH leading role
>2,100 mentions of LIH/IBBL in the press
2.1 million biological samples collected and aliquots created (IBBL)
109,675 biological samples distributed (IBBL)
16.6 Mio€ Third-party income (without LST COVID-19)
46.3 Mio€ Third-party income (with LST COVID-19)

About the Luxembourg Institute of Health: Research dedicated to life

The Luxembourg Institute of Health (LIH) is a public research organization at the forefront of biomedical sciences. With its strong expertise in population health, oncology, infection and immunity as well as storage and handling of biological samples, its research activities have an impact on people's health. At LIH, devoted scientists investigate disease mechanisms to develop new diagnostics, innovative therapies and effective tools to implement personalized medicine.

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